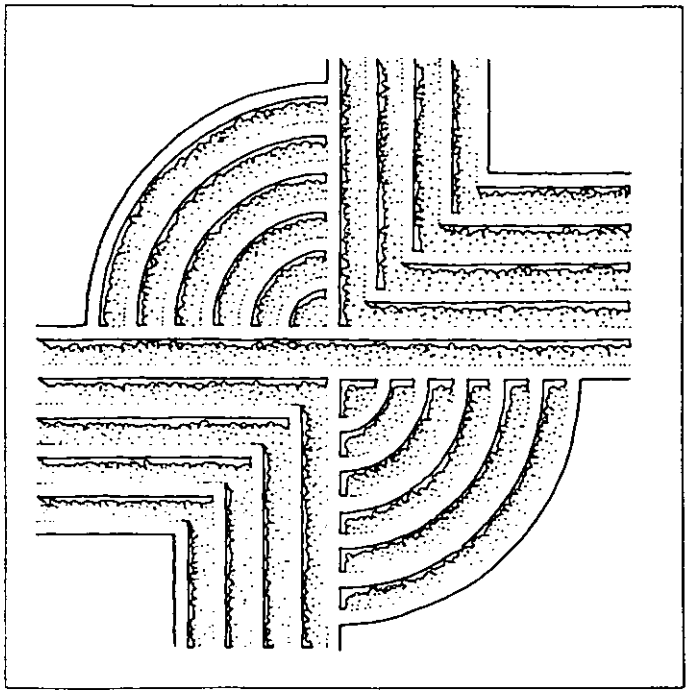
ARCHAEOLOGICAL RECONNAISSANCE SURVEY OF THE PROPOSED BASF PIPELINE, ANDERSON COUNTY, SOUTH CAROLINA



CHICORA RESEARCH CONTRIBUTION 225

ARCHAEOLOGICAL RECONNAISSANCE SURVEY OF THE PROPOSED BASF PIPELINE, ANDERSON COUNTY, SOUTH CAROLINA

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ABSTRACT

This study reports on a reconnaissance level archaeological survey of a proposed gas pipeline corridor situated southwest of the City of Anderson in Anderson County. The corridor is approximately 9500 feet in length and will be about 25 to 50 feet in width. It runs from the BASF plant southwardly to an existing gas pipeline. The line is not yet staked in the field, but the corridor was walked with both Mr. Richard Thomas, Chief Engineer with Douglas Pipeline and Mr. Roger Hartman, Utilities Engineer with BASF. In addition, it largely follows an existing electrical transmission line corridor.

Examination of the site files at the South Carolina Institute of Archaeology and Anthropology revealed that no archaeological sites were recorded in the project area. An inquiry made to the South Carolina Department of Archives and History for any previous architectural surveys or the presence of any National Register properties, sites, districts, or objects. None were recorded in the project vicinity.

Although only a reconnaissance level investigation was requested by the State Historic Preservation Office, the entire corridor was walked. Erosional or bare areas were examined, judgmental shovel tests were excavated and screened in areas of high archaeological probability, and additional shovel tests were judgmentally excavated to verify soil conditions on the surface.

The corridor was found to be heavily eroded, with clay subsoil within the upper 0.1 to 0.2 foot of most profiles and, in several areas, to be exposed on the surface. In addition, many of the tests exhibited large quantities of gravel in the tests, indicative of the extreme erosion.

Only one site was identified in the corridor, but it was possible to immediately re-route the right-of-way by about 1,000 feet, avoiding this site. Additional reconnaissance level survey was conducted on the new corridor, and no archaeological sites were encountered.

Based on these findings, we do not recommend any additional archaeological investigations, although this recommendation must be reviewed by the State Historic Preservation Office. In addition, it is always possible that unrecognized archaeological remains may be identified during construction. If so, the contractor should suspend work and notify either Chicora or the State Historic Preservation Office.

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INTRODUCTION

This reconnaissance level investigation of the proposed BASF gas pipeline in Anderson County was conducted by Dr. Michael Trinkley of Chicora Foundation, Inc. for Douglas Oil and Gas, Inc. The project is situated in the central portion of Anderson County, just southwest of the City of Anderson (Figure 1). The corridor for the gas pipeline is estimated to be about 25 to 50 feet in width (including construction zone) and for much of its length it will follow an existing electrical transmission line corridor.

The survey corridor begins at the southwestern edge of the BASF plant property and traverses open pasture before crossing Richland Creek. It then tends southeastwardly, joining up with an existing powerline easement running through an area of pasture and light planted pines. Skirting a small neighborhood at Tauervus Road, it continued through additional pasture primarily along ridge tops and side slopes to eventually join with an existing natural gas pipeline. The corridor is approximately 10,500 feet in length (Figure 2).

The proposed work on the corridor will likely include some minor clearing and grubbing of the corridor, followed by excavation of a trench approximately 3-feet in width for the placement of the gas pipeline. Richland Creek will likely be crossed above ground. This work has the potential to damage or even destroy archaeological sites in the immediate vicinity.

We were requested by Ms. Mary Read of Douglas Oil and Gas to submit a cost proposal for a reconnaissance level survey of the project on June 2, 1997. This proposal, submitted on that same day, was approved on June 11, 1997. These investigations incorporated a review of the site files at the South Carolina Institute of Archaeology and Anthropology by Ms. Rachel Brinson-Marrs on June 16, 1997. No previously recorded sites were recorded in or near the project area. In addition, Dr. Tracy Power at the South Carolina Department of Archives and History was asked on June 16, 1997 to check the master topographic maps at his office to locate any NRHP buildings, districts, structures, sites, or objects in the study

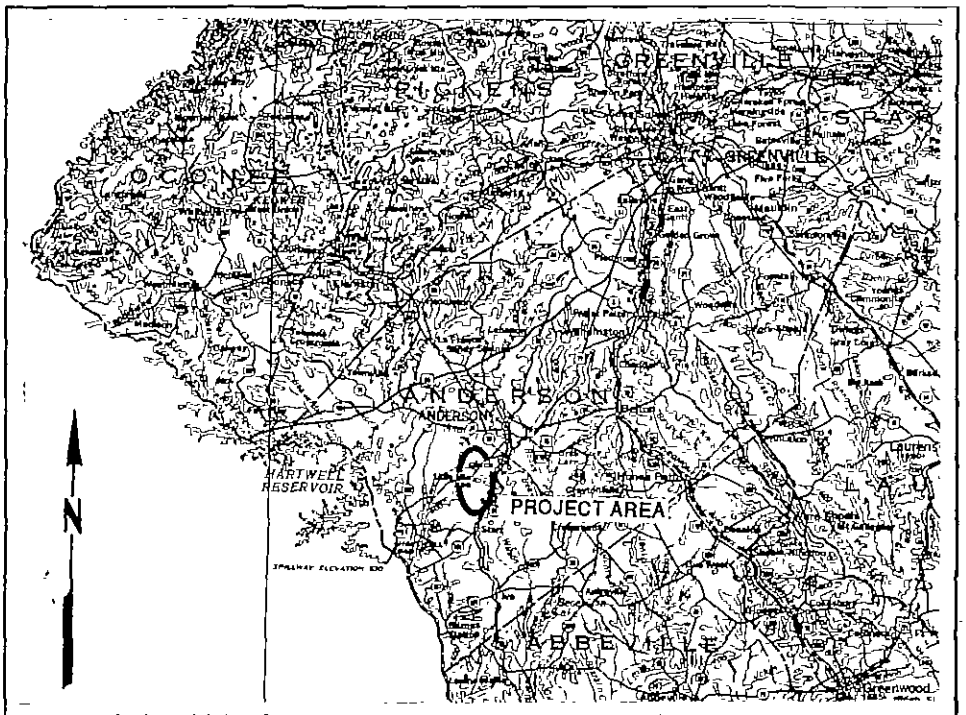

Figure 1. Project vicinity (from USGS South Carolina, scale is approximately 1-inch to 16-miles).

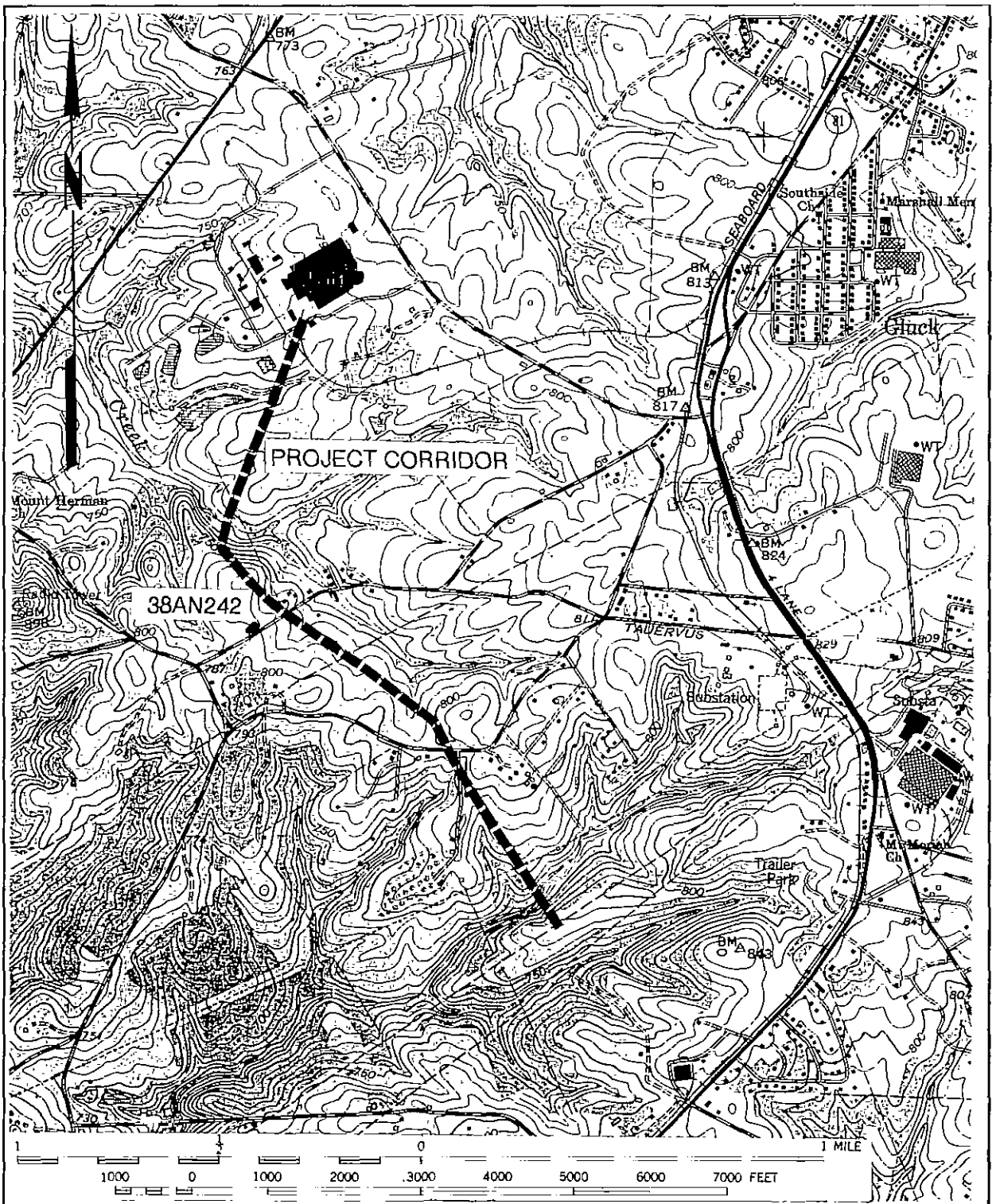

Figure 2. Project boundaries shown on a portion of the Anderson South USGS topographic map.

area. In addition, his office was asked about the results of any structures surveys which might have been completed in the study area. On June 18 he reported that there were no National Register properties in the corridor. In addition, there were architectural sites recorded for the project area. Archival and historical research was limited to a review of secondary sources available in the Chicora Foundation files.

The survey, which was designed to identify prehistoric or historic resources which may be within the project corridor or on the proposed pipeline corridor, was conducted June 18 by Dr. Michael Trinkley. A total of seven person hours were required for the study.

NATURAL ENVIRONMENT

Physiographic Province

The project area is situated in the central corner of Anderson County, southwest of the City of Anderson. It primarily falls on ridge side slopes, although it skirts several ridge tops and one saddle area. It also crossed several drainages, including Richland Creek (Figures 1 and 2).

Anderson County is in the northwestern part of South Carolina and is bounded to the north by Oconee and Pickens counties and to the south by Abbeville County. The eastern border, shared with Greenville County, follows the Saluda River, while the western boundary with Georgia is defined by the Savannah River, part of which has been flooded to create Hartwell Reservoir.

A 1944 congressional act authorized hydro-electric projects on the Savannah River and the Hartwell Reservoir, covering 23,633 acres, was the second Army Corps project, completed in 1963 (Kovacik and Winberry 1987:201). Like the Clark Hill project, it was completed with relatively little controversy (and virtually no archaeological research). The last of the three projects contemplated by Congress in 1944 was the Richard B. Russell Reservoir (originally the Trotter Shoals project). This reservoir was not completed until 1983 and faced a hailstorm of public and environmental opposition.

The county is located within the Piedmont region. Physiographically, the county is a thoroughly dissected plain. The relief ranges from nearly level to steep, but it is dominantly gently sloping to moderately steep (Herren 1979:1). Although county-wide the elevations range from 450 feet above mean sea level (AMSL) to 1,014 feet AMSL, the elevations in the project area range from about 750 to 800 feet. In general these elevations vary as the corridor crosses drainages, although much of the right-of-way will fall on side slopes.

The drainages form a dendritic pattern and throughout the Piedmont this terrain has been extensively dissected and degraded. The Savannah River and its tributaries, such as Big and Little Generostee creeks drain the western third of the county, while the Saluda River and its tributaries, such as Big Creek and Broad Mouth Creek drain the eastern third. The central portion of the county drains south into Rocky River. Richland Creek and several smaller drainages in the project area flow primarily westward, toward the Savannah.

Geology and Soils

Most of the rocks of the Piedmont are gneiss and schist, with some marble and quartzite (Hasselton 1974). Some less intensively metamorphosed rocks, such as slate, occur along the eastern part of the province from southern Virginia into Georgia. This area, called the Slate Belt, is characterized by slightly lower ground with wider river valleys. Consequently, the Slate Belt has been favored for reservoir sites (Johnson 1970), as well as prehistoric occupation (see Coe 1964). Anderson County is just above the Slate Belt, in an area characterized by highly metamorphosed gneisses, schists, and amphibolites (Murphy 1995:47). There is only one association in Anderson County formed in loamy alluvial sediments found in the floodplains. The bulk of the soils are formed in materials weathered from the underlying bedrock of granite, schist, or gneiss.

The project area is primarily situated on Cecil sandy loams, with slopes ranging from 2% to 10%, although other soil series include the Cecil clay loams, 6-10% slopes, eroded; Pacolet sandy loams, 15-25% slopes; Cataula sandy loams, 6-10% slopes; and, in the drainages, Toccoa-Cartecay complex (Herren 1979: Map 45).

The Cecil soils, where an A horizon is present, exhibit about 0.5 foot of brown (10YR4/3) sandy loam over a B horizon of red (2.5YR4/6)

clay. The Cataula soils have a similar A horizon, although the B horizon is characterized by a brown (7.5YR5/4) clay loam and the Pacolet soils have a yellowish-brown (10YR5/4) sandy clay loam A horizon over a red (2.5YR4/6) clay B horizon.

The 1975 aerial photographs reveal that most of the proposed corridor has been under pasture for a number of years. This is likely because many of the soils, as evidenced during the judgmental shovel testing, revealed very thin A horizons -- likely developed over the past 50 years of conservation farming. In numerous locations there was abundant gravel within the upper 0.4 foot of the soil, indicating that the A horizon had been completely eroded, with the erosion extending into the underlying B horizon.

In fact, the 1934 South Carolina Erosion Survey by M.W. Lowry found that this portion of Anderson County exhibited severe sheet erosion with occasional gullies (Lowry 1934). This portion of Anderson County has lost up to 1.1 foot of soil through erosion in the nineteenth and early twentieth centuries (Trimble 1974:3). It is part of the area classified by Trimble as having high antebellum erosion land use with postbellum continuation and belonging to his Region III -- the Cotton Plantation Area (Trimble 1974:15).

Within recent times this area has been logged, likely increasing soil loss originating during earlier agricultural activities. The United States Forest Service has determined that logging accounts for upwards of 0.36 tons of soil erosion per acre per year in this region, while areas of skid trails have erosion rates of about 9.91 tons per acre per year (U.S. Department of Agriculture 1980:25). This is clearly evidenced by the occasional shovel tests conducted in the project area (discussed in a following section of this study).

In 1826 Robert Mills remarked that the soils of the Pendleton District (of which Anderson comprised the southern half) were primarily "red clay, susceptible of great and lasting improvements" (Mills 1826:673). In addition, he was already sounding an alarm, commenting that:

> The deteriorating effects consequent upon the planting system, observable in other districts, should prove a lesson to this, to avoid falling into the same error. The woods will disappear fast enough, without clearing more land than can be cultivated to advantage; and, in a hilly country like Pendleton, particular care should be taken, when the lands are left in fallow, to keep them enclosed; and to given them a vegetable coat, to guard the surface from being washed away. It is deplorable to see the neglect of many of our planters in different districts, in this respect; and the consequent destruction of some of the finest farming lands (Mills 1826:683-684).

Fairfield planter William Ellison remarked in 1828 that "the successful cotton planter sits down in the choicest of his lands, slaughters the forest, and murders the soil" (quoted in Ford 1988:38). In 1842 agricultural reformer Edmund Ruffin warned of impending disaster from the reliance on cotton and observed that little effort was being made to protect the land (Ruffin 1843:73).

In spite of these early warnings, the South Carolina Department of Agriculture, Commerce, and Immigration, as late as 1907, found no reason to remark on the threat of erosion, noting only that "the second best cotton lands are found in Anderson and Laurens Counties" (State Department of Agriculture, Commerce, and Immigration 1907:255). Anderson boasted of ten cotton seed oil mills and ranked second only to Orangeburg in cotton production in 1906 (State Department of Agriculture, Commerce, and Immigration 1907:269, 288).

Climate

Elevation, latitude, and distance from the coast work together to affect the climate of South Carolina, including the Piedmont. In addition, the more westerly mountains block or moderate many

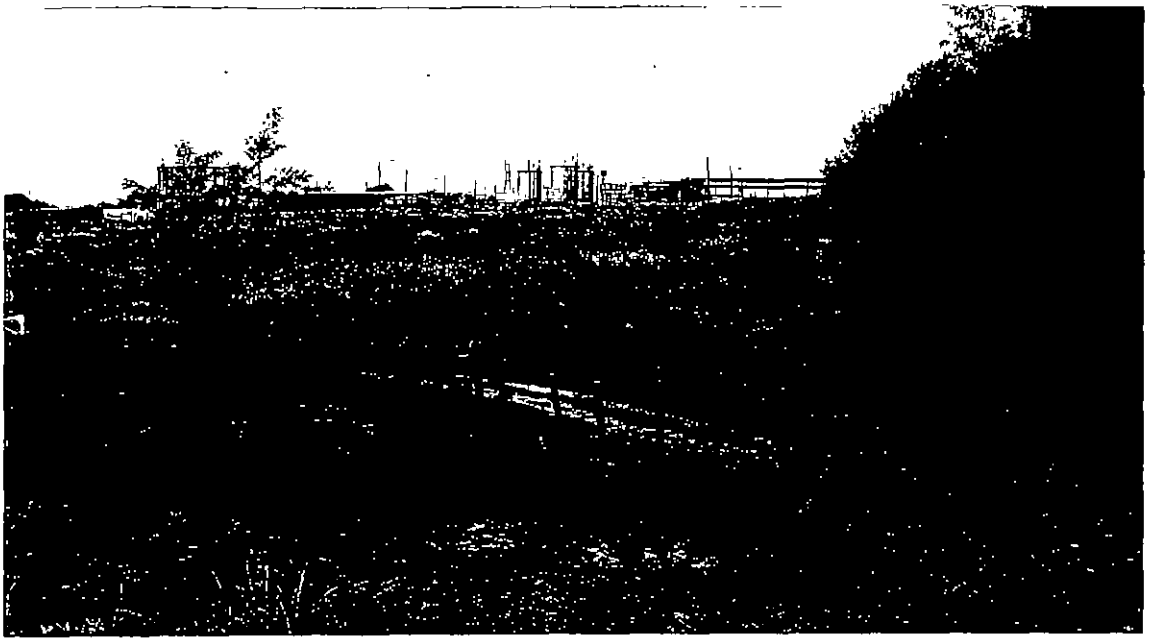

Figure 3. Area of the proposed corridor south of the BASF plant (shown in the background) crossing pasture and exposed B horizon soils.

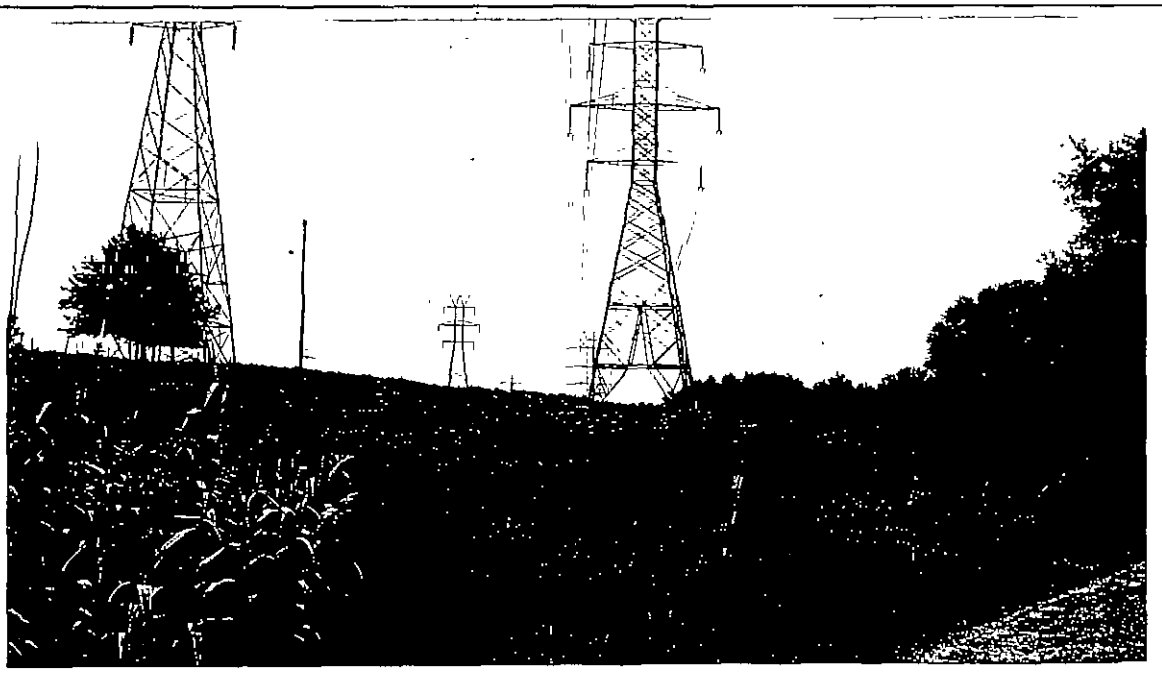

Figure 4. Area of the proposed corridor paralleling the transmission lines through pastures.

of the cold air masses that flow across the state from west to east. Even the very cold air masses which cross the mountains are warmed somewhat by compression before they descend on the Piedmont.

Consequently, the climate of Anderson County is temperate. The winters are relatively mild and the summers warm and humid. Rainfall in the amount of about 46 inches is adequate, although less than in some neighboring counties. About 23 inches of rain occur during the growing season, with periods of drought not uncommon during the summer months. As Hilliard illustrates, these droughts tended to be localized and tended to occur several years in a row, increasing the hardship on those attempting to recover from the previous year's crop failure (Hilliard 1984:16). Perhaps the best wide-scale example of this was the drought of 1845, which caused a series of very serious grain and food shortages throughout the state.

The average growing season is about 217 days, although early freezes in the fall and late frosts in the spring can reduce this period by as much as 10 or more days (Herren 1979: Table 3). Consequently, most cotton planting, for example, did not take place until middle May, avoiding the possibility that a late frost would damage the young seedlings.

Floristics

Piedmont forests generally belong to the Oak-Hickory Formation as established by Braun (1950). The potential natural vegetation of the area is the Oak-Hickory-Pine forest, composes of medium tall to tall forests of broadlead deciduous and needleleaf evergreen trees (Küchler 1964). The major components of this ecosystem include hickory, shortleaf pine, loblolly pine, white oak, and post oak. In actuality, the Piedmont is composed of a patchwork of open fields, pine woodlots, hardwood stands, mixed stands, and second growth fields. Shelford (1963) includes the Carolina Piedmont in the Oak-Hickory zone of the Southern Temperate Deciduous Forest Biome.

Today the "patchwork" is more than ever clearly visible. The survey corridor includes a few areas of barren soil (Figure 3), grassed pastures (Figure 4), and planted pines. There is virtually no vegetation in the project area that is consistent with the native forests of the area.

PREHISTORIC AND HISTORIC OVERVIEW

Previous Research

The Piedmont has been the focus of considerable archaeological research. Derting et al. (1991), for example, cite 89 studies specific to Anderson County. Virtually all of these are compliance related, with 38% being surveys for highway department related activities and an additional 38% being related to the various Army Corps reservoir projects in the area.

There is no single synthesis of the area's archaeology. Perhaps the most thorough overview specific to the Anderson County area is the survey of the Laurens-Anderson highway connector (Goodyear et al. 1979). In addition, the Paleoindian and Early Archaic is carefully explored by a variety of authors in an edited volume by Anderson and Sassaman (1996). These same researchers have also explored the Middle and Late Archaic (Sassaman and Anderson 1994). The Woodland and Mississippian is less well researched for the Piedmont, although Anderson (1994) does provide a generalized overview.

Dr. Tracy Power of the South Carolina Department of Archives and History (personal communication 1997) reports that there are no National Register buildings, districts, structures, sites, or objects in the survey area. In addition, no archaeological sites are recorded at the South Carolina Institute of Archaeology and Anthropology for the general area of this study.

Prehistoric Overview

In the Carolina Piedmont, lithic scatters are the most common type of prehistoric site encountered. Goodyear et al. (1979:131-145) found that lithic scatter sites located in the inter-riverine Piedmont were geographically extensive and exhibited little artifact diversity. These sites have been interpreted as:

> limited or specialized activity sites which represent resource exploitation or other distinct functions. Nearly all investigators working in the Piedmont have related these sites to activities involving hunting, nut gathering, and procuring of lithic raw materials (Canouts and Goodyear n.d.:8).

Although the vast majority of these sites are located in eroded areas and exhibit little to no subsurface integrity, Canouts and Goodyear (1985) argue that they have analytical value. This value lies in their horizontal rather than vertical dimensions. They argue that:

> [f]uture investigators of upland sites must effect broad-scale spatial analyses comparable to the temporal analyses effected through excavation of deeply stratified sites. Both endeavors are necessary, and neither is sufficient for the total understanding of Piedmont prehistory" (Canouts and Goodyear 1985: 193).

One observation that Canouts and Goodyear (1985) made is that lithic raw material ratios change through time. For instance, at the Gregg Shoals site in Elbert County, Georgia, the Early Archaic assemblage reflects greater use of non-local cryptocrystalline materials and the Late Archaic, greater use of non-quartz local material (see Tippitt and Marquardt 1981). Examination of changing use of lithic resources will help archaeologists better understand issues such as the extent of seasonal rounds, trade networks, and social organization. Clearly, the discussions by Canouts and Goodyear (1985) argue strongly for a higher regard for the "lowly" lithic scatter — a very

common occurrence in the Piedmont.

Figure 5 provides an overview of the cultural sequence commonly found in the Piedmont of South Carolina.

Paleoindian Period

The Paleoindian period, lasting from 12,000 to 8,000 B.C., is evidenced by basally thinned, side-notched projectile points; fluted, lanceolate projectile points; side scrapers; end scrapers; and drills (Coe 1964; Michie 1977). The Paleoindian occupation, while widespread, does not appear to have been intensive. Points usually associated with this period include the Clovis and several variants, Suwannee, Simpson, and Dalton (Goodyear et al. 1989:36-38).

Unfortunately, little is known about Paleoindian subsistence strategies, settlement systems, or social organization. Generally, archaeologists agree that the Paleoindian groups were at a band level of society, were nomadic, and were both hunters and foragers. While population density, based on the isolated finds, is thought to have been low, Walthall suggests that toward the end of the period, "there was an increase in population density and in territoriality and that a number of new resource areas were beginning to be exploited" (Walthall 1980:30).

Very little work in the state has been able to focus on Paleoindian settlements because of the rarity of the site type. No evidence was found for Paleoindian occupation in the Laurens-Anderson inter-riverine area, which is not surprising since elsewhere in the state these sites are usually found clustered along major drainages and their tributaries which is interpreted by Michie (1977:124) to support the concept of an economy "oriented towards the exploitation of now extinct mega-fauna."

One site identified in the Sumter National Forest (Price 1992), in neighboring Laurens County, is believed to have a possible Paleoindian component (38LU317). It is situated on a ridge saddle adjacent to a spring which feeds into the Enoree River, located only about 0.3 miles to the north. This fits well with previous arguments that Paleoindian sites will be located adjacent to major drainages.

Anderson (1992:32) suggests that the comparatively low density of Paleoindian diagnostics in South Carolina may be because the state could have been on the edge of the ranges of groups centered in other areas. He suggests that permanent settlements elsewhere probably occurred later in the Paleoindian period, only when population levels had grown appreciably in these centers. This would help to explain the overlap in stylistic traditions (such as the Clovis, Suwannee, Simpson, and Dalton) observed in South Carolina which perhaps resulted from populations expanding outward from these centers.

Archaic Period

The Archaic period, which dates from 8000 to as late as 500 B.C. in the Piedmont, does not form a sharp break with the Paleoindian period, but is a slow transition characterized by a modern climate and an increase in the diversity of material culture. Archaic period assemblages, characterized by corner-notched, side-notched, and broad stemmed projectile points, are common in the vicinity, although they rarely are found in good, well-preserved contexts (for a thorough discussion of the Early Archaic, see Anderson and Sassaman 1996, while Anderson and Joseph 1988 offer a review of prehistoric archaeology along the upper Savannah River).

Prehistoric sites in the Piedmont inter-riverine zones are for the most part characterized as "upland lithic scatters" (House and Wogaman 1978:xii). These sites are shallow deposits without stratigraphic definition, contain a diversity of artifacts, and are commonly disturbed by plowing and/or erosion (Canouts and Goodyear 1985; Trinkley and Caballero 1983:27).

Early Archaic

During the Laurens-Anderson study (Goodyear et al. 1979), four sites with Early Archaic components were identified. Each of these

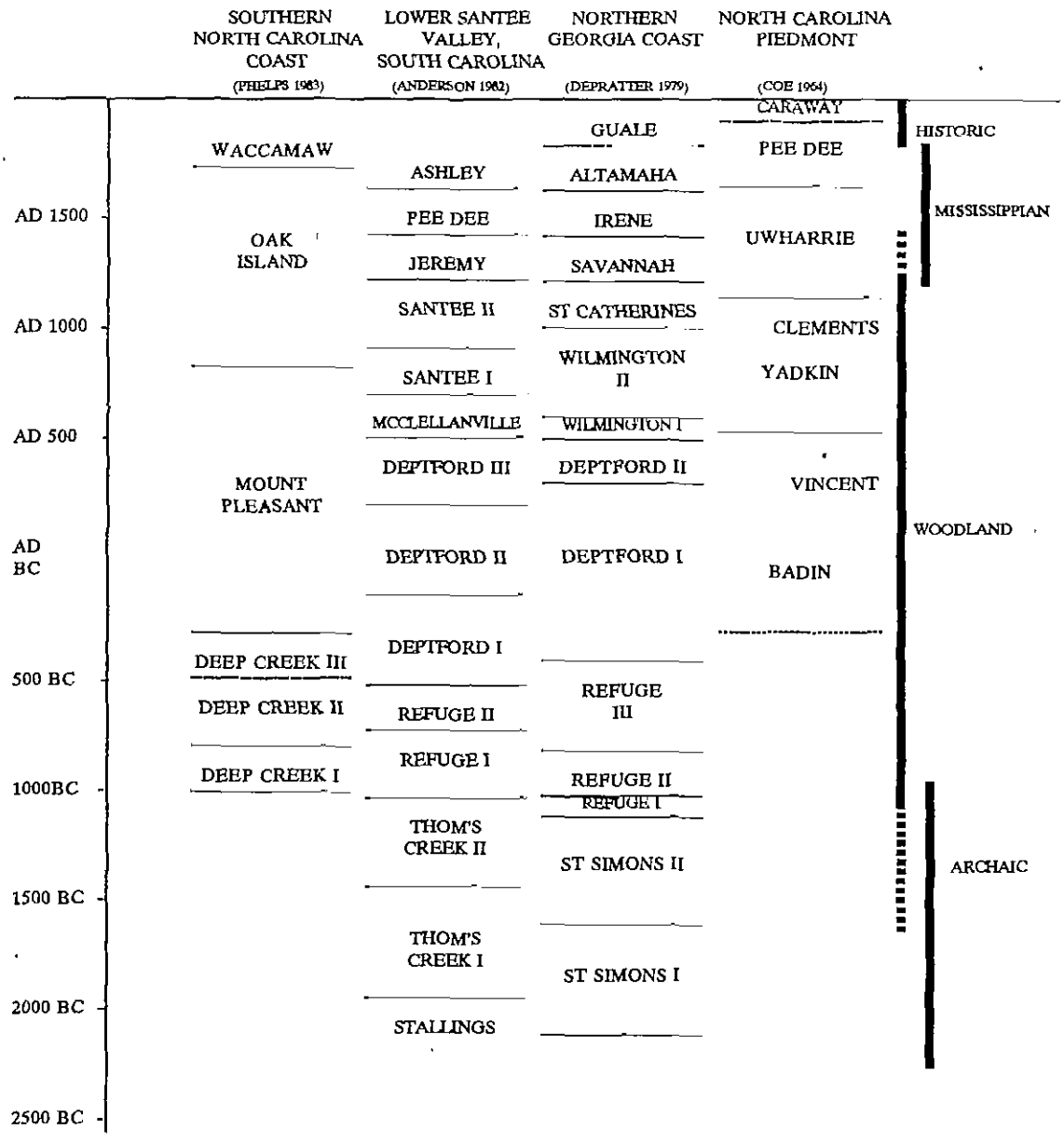

Figure 5. Cultural sequence for the South Carolina upcountry.

sites contained a single example of Dalton[1] points or probable Dalton preforms made of indigenous Piedmont quartz. The following Palmer phase was found to be very common in the area and was represented by 28 sites. While most of the specimens were manufactured from the local quartz, some were manufactured from Coastal Plain chert from the Flint River formation located in the lower coastal plain of South Carolina and Georgia. There were also examples of metavolcanic rhyolite from the Carolina Slate Belt and what may be "Ridge and Valley chert" from eastern Tennessee.

At these sites a wide range of tool types were identified including a large number of unifacial and flake tools believed to be associated with the Early Archaic occupation. Goodyear et al. (1979:197) found that while Early Archaic sites with unifaces were found throughout the corridor, sites on ridgetops which were large watershed divides produced higher counts. They believe that the large number of sites producing Palmer points is related to environmental changes at that time. The large diversity in lithic raw material provided information regarding their "mobility patterns and regions of interactions" (Goodyear et al. 1979:198).

Anderson and Hanson's (1988) band/macroband model of Early Archaic settlement was formulated primarily to evaluate data from the Savannah River basin. In the Savannah River Valley, settlement organization of the Early Archaic people was "characterized by the use of a logistically provisioned seasonal base camp or camps during the winter, and a series of short-term foraging camps throughout the remainder of the year" (Anderson 1992:36). During the early spring, the groups are believed to have moved toward the coast, then back into the upper coastal plain and piedmont during the later spring, summer, and early fall. During the winter they returned to their base camp incorporating some side trips to other drainages for aggregation events by groups from two or more different drainages. These aggregation sites are believed to have been located on Fall Line river terraces (Anderson 1989a:36). One example of a postulated base camp is the G.S. Lewis site at the Savannah River Site. This site is located on a ridge adjacent to the confluence of Upper Three Runs Creek and the Savannah River. Given this scenario for the Savannah River basin (which likely applies to other river basins), Early Archaic sites in the Piedmont were likely occupied from summer until fall and don't include aggregation sites. Anderson and Hanson (1988) place the Upper Piedmont in the Saluda/Broad macroband settlement system. At the band level, they proposed "co-residential population aggregates" consisting of 50 to 150 people which occupied and moved primarily within one drainage basin. They projected that individual macroband population was between 500 and 1500 people. They also formulated a spatial model for the distribution of individual bands over the South Atlantic Slope.

Anderson (1989b) notes that data from the Savannah River Site and the Richard B. Russell Reservoir "suggest that a decline in utilization of the Coastal Plain may have occurred at the same time as an increase in utilization of the Piedmont [and] may be a part of a trend noted in the terminal Early Archaic in the general region. Settlement patterning in any given area was thus likely shaped by a range of variables, such as local resource structure, as well as by more regional trends in climate, population density, and these patterns apparently changed appreciably over time" (Anderson 1992:39). Data from the Laurens-Anderson study and the Savannah River project suggests that inter-riverine sites will be found on hills between watershed divides and riverine sites will be located on knolls adjacent to a major confluence.

Middle Archaic

Morrow Mountain and Guilford points constituted the primary evidence for Middle Archaic (5000 to 3000 B.C.) occupation in the Laurens-Anderson corridor (Goodyear et al. 1979). Morrow Mountain constituted the vast bulk of these projectile points and were present in both

[1] Some researchers (see, for instance, Anderson 1992) classify Dalton as Paleoindian while others (Goodyear et al. 1989) classify it as Archaic.

the I and II varieties.[2] Over 95% of the 145 points were manufactured from the local quartz, which parallels other findings in Piedmont South Carolina. Guilford was not nearly as prominent and consisted of 35 finished specimens or preforms, all of which were manufactured from quartz.[3]

The Middle Archaic period was found to consist of the largest number of sites. In terms of geographic distribution, Goodyear et al. (1979) found that the Morrow Mountain phase was much like the Palmer phase, with sites occurring on ridges between watersheds. However, the almost complete reliance on local quartz separates the Morrow Mountain and Guilford phase sharply from the earlier Palmer phase. They suggest that "[t]he large number of Middle Archaic sites well dispersed through the inter-riverine areas and the abundant nature of chipped quartz remains on these sites suggest frequent movement and activity throughout the Piedmont of South Carolina" (Goodyear et al. 1979:207). Data from early reservoir projects (see, for example, Wauchope 1966) as well as inter-riverine observations by Caldwell (1954; 1958) and Coe (1952) made it clear that there were sharp contrasts between riverine and inter-riverine sites in terms of artifact diversity and density, and in the use of shellfish (Sassaman and Anderson 1994:134). With the advent of cultural resource management in the 1970s, additional data was available and further emphasized these differences. All of this data indicated that the largest and densest sites were located along large rivers, and that small, sparse sites were found throughout the uplands. While these differences were clear, what remained unclear was the relationship between riverine and inter-riverine sites in a settlement-subsistence system, and how, if at all, this system changed over time (Sassaman and Anderson 1994:135).

House and Ballenger studied this issue during their survey work on the proposed Interstate 77 project in 1976. They classified riverine zones of containing only the largest rivers while inter-riverine zones consisted of smaller rivers and streams. House and Ballenger (1976) argued that streams with a ranking of 3 or higher[4] contained resources that were not abundant in the uplands (fish, turtle, raccoon, etc.), whereas smaller streams had a higher density of deer and nut masts. The resulting archaeological assemblages from these distinct areas should, themselves, be distinct (House and Ballenger 1976; Sassaman and Anderson 1994). They divided their sites into habitation and extraction sites[5] using a lithic tool classification scheme that would allow functional sorting of the two site types. From the information gathered using this analysis, coupled with data on the seasonal availability of resources, they created a Middle and Late Archaic settlement model:

involving spring and summer

[2] Coe (1964) describes Morrow Mountain I as a small triangular blade with a short pointed stem, while the Morrow Mountain II is described as a long narrow blade with a long tapered stem. While he describes them as different types, he notes that many people have chosen not distinguish between the two.

[3] Preforms represent an intermediate stage between flakes from secondary cores and quarry blades. Some are worked bifacially, although most are unifacial and still retain the platform and bulb of percussion. Quarry blades are usually bifacially worked and are made to allow easy transportation of lithic materials until the time it is needed to be made into a projectile point. Some researchers have used the terms preform and quarry blade interchangeably, meaning the bifacially worked ovate blade.

[4] According to the system, based on Strahler (1964) 1st order streams are the fingertip tributaries at the head of a stream and may either be year-round or seasonally flowing streams. A 2nd order stream is formed by the confluence of two 1st order streams. A 3rd order stream is formed by the confluence of two 2nd order streams, etc. This system requires that at least two streams of a given order be joined to form a stream of the next highest order. The main stem of a river will always have the highest order.

[5] An extraction site is an area where resources (such as fish, lithic raw material, etc.) were obtained and is often represented by lithic debitage and perhaps small camp sites. A habitation site is a seasonal or temporary camp where these resources were usually consumed, used, or worked.

> residence along major rivers; a move to seasonal base camps in upland creek valleys in September to take advantage of deer concentration in upland hardwood zones, with some exploitation of other resources as well; and then a return to riverine-located winter quarters with permanent houses in about December when the coldest months arrived, the deer rutting season came to an end, and the acorn mast in the hardwood forests began to be exhausted (House and Ballenger 1976:117).

The Windy Ridge site (House and Wogaman 1978), while fitting the expected upland site profile as proposed by House and Ballenger (1976), may have been used as a habitation site during the Middle Archaic. Other projects also complicated the model. Work in the Richard B. Russell Reservoir (Anderson and Schuldenrein 1985; Tippett and Marquardt 1981) examined a number of sites with Morrow Mountain components. Interestingly, none of these riverine sites produced denser or more diverse remains than did inter-riverine sites. This suggested that Middle Archaic people were not using the riverine and inter-riverine areas much differently in this part of the state (Sassaman and Anderson 1994:137).

Sassaman (1983) attempted to more closely examine Middle and Late Archaic settlement patterns by examining sites from a number of piedmont studies. He found that Middle Archaic settlement in the South Carolina Piedmont did not fit the riverine-inter-riverine model. This suggested that Middle Archaic people were much more mobile, perhaps moving residences every few weeks which fit Binford's (1980) definition of a foraging society. Binford (1980) proposed that foragers had high levels of residential mobility, moving camps often to take advantage of dispersed, but similar resource patches. Collectors stayed in one location longer, by sending out specialized work parties to exploit resources in widely dispersed and distinct resource patches. He believed that differences in environmental structure could be traced to large scale climactic factors. He further noted that a collector system could arise under any conditions that limited the ability of hunter-gatherers to relocate residences. During his work in the Haw River area of North Carolina, Cable (1982) argued that postglacial warming at the end of the Pleistocene led to increased vegetational homogeneity which encouraged foraging.[6]

Sassaman (1983) suggests that this indicates a large degree of homogeneity of the piedmont environments. They also had a high degree of social flexibility, allowing them to pick up and move when needed. This high level of mobility did not allow them to transport much material, which in turn, alleviated the need for elaborate or specialized tools to procure and process resources at locations distant from camp. Since quartz is practically everywhere in the piedmont, tools could be easily replaced and were expedient. The high mobility and the expediency of tools helps to explain the abundance of Middle Archaic sites in the piedmont without having to imply a population explosion. Sassaman called this model the "Adaptive Flexibility" model (Sassaman 1983; Sassaman and Anderson 1994).

Late Archaic

Savannah River Stemmed and Otarre[7] stemmed points are the primary indicators of Late Archaic settlement in the Laurens-Anderson study area. Ten Savannah River phase sites and seven Otarre phase sites were identified. Quartz tools, which were found in overwhelming abundance at earlier sites, consisted only of about 57% of the Savannah River assemblage. Other materials

[6] Since the vegetation was homogeneous and there were no concentrations of resources people moved from place to place foraging rather than settling near or in these resource concentrations.

[7] According to Oliver (1981) the Otarre type is contemporaneous with the Savannah River stemmed type and fall within the category of "Small Savannah River Stemmed".

included "silicates, volcanic slate/argillite, and unknown igneous/metamorphic" (Goodyear et al. 1979:207). The Otarre assemblage reflected a trend away from igneous/metamorphic rock, with a concentration of quartz and siliceous materials. The incorporation of more types of lithic raw material as well as the fact that Late Archaic diagnostics are much fewer than Middle Archaic diagnostic artifacts indicates a sharp decrease in residential mobility.

Many of these Late Archaic sites produced fire cracked rock which was found on major ridges between watersheds. Goodyear et al. (1979:209-210) found that the inter-riverine picture of the Late Archaic contrasted quite sharply with river sites. Artifacts at riverine sites were diverse and included steatite vessels and netsinkers[8], ground stone axes, rock mortars and handstones, atlatl weights, and chipped stone drills. In the upland sites, the assemblage consists almost entirely of chipped stone bifaces and debitage. Purrington (1983) also noted this trend for the mountain region of North Carolina. At the Savannah River Plant, both riverine and upland sites contained a full range of tools, but no architectural features have been located.

Soapstone became an important lithic resource in the Late Archaic period for manufacturing of cooking vessels, and a number of soapstone quarries have been identified in Spartanburg and Cherokee counties (Ferguson 1976). Unfortunately, little is known about patterns in local soapstone use, although Elliott (1981) argues that soapstone exchange in the upcountry was facilitated by local reciprocal relationships. Soapstone was also probably used as a mechanism to maintain long distance relationships through long distance trade. Sassaman et al. state that:

> [c]ompared to sites in the upper and lower reaches of the Coastal Plain, a higher proportion of sites in the middle portion of the plain contain soapstone artifacts. This may indicate that soapstone distributions were not merely the result of distance-decay from sources, but were much more dependent on the social composition of exchange alliances (Sassaman et al. 1988:90).

For the Late Archaic, John White (1982) also applied a riverine/inter-riverine dichotomy. He demonstrated that riverine sites were much more dense and diverse than inter-riverine sites, but also identified the existence of diverse and sometimes dense assemblages at upland sites. He argued that they were habitation camps during periods of seasonal dispersal from riverine aggregation bases.

Although Steven Savage (1989) has proposed a "Late Archaic Landscape" model, a number of researchers (i.e. Anderson 1989a; Cable 1994; and Rafferty 1992) have noted that his study was seriously flawed by the "misappropriation of data from the Richard B. Russell survey" (Sassaman and Anderson 1994:142). The purpose of the work was to attempt to apply the locational methods of GIS to the analysis of Late Archaic social systems in the Upper Savannah River Valley. However, he only chose to use early intensive survey data and ignored subsequent data from testing and excavation. In addition, he chose to ignore problems such as multicomponentcy and representativeness (Cable 1994). Although it was considered a noteworthy study since it was the first to use Geographic Information Systems (GIS) for the analysis of settlement distribution, "the errors detract from the potential value of Savage's approach" (Sassaman and Anderson 1994:142).

Woodland Period

The Woodland period begins, by definition, with the introduction of fired clay pottery about 2000 B.C. along the South Carolina coast and much later in the Carolina Piedmont, about 500 B.C. Regardless, the period from 2000 to 500 B.C. was a period of tremendous change.

[8] Sassaman (1991:87-88) states that "perforated and grooved objects are common items in Late Archaic assemblages of the Savannah River Valley. Both the grooved and perforated varieties have been referred to as "netsinkers", but the more common perforated slave was apparently used as a cooking stone."

The subsistence economy during this period was based primarily on deer hunting and fishing, with supplemental inclusions of small mammals, birds, reptiles, and shellfish. Various calculations of the probable yield of deer, fish, and other food sources identified from some coastal sites indicate that sedentary life was not only possible, but probable. Further inland it seems likely that many Native American groups continued the previous established patterns of band mobility. These frequent moves would allow the groups to take advantage of various seasonal resources, such as shad and sturgeon in the spring, nut masts in the fall, and turkeys during the winter.

Early Woodland

Brooks and Hanson (1987) noted significant changes in the density and distribution of upland tributary sites during the Woodland period in the Steel Creek area of the Savannah River Plant. Brooks proposed that as tributary associated habitats became more productive with floodplain maturation that upland tributary terraces became areas of more permanent occupation. For the Savannah River area, the data suggested to Brooks that annual settlement ranges in the Early Woodland period were restricted to tributary watersheds (Sassaman et al. 1990:315).

Artifacts typical of the Early Woodland in the Upper Piedmont consist of Dunlap and Swannanoa ceramics (similar to the Kellog focus of Northern Georgia). The Dunlap series is characterized by a medium to coarse sand paste, fabric impressions, and vessels with a simple jar or cup form. The Swannanoa ceramics, with heavy crushed quartz temper, are cord marked or fabric impressed conoidal jars and simple bowls. Other surface treatments consist of simple stamping, check stamping, and smoothed plain (Keel 1976:230). Early Woodland projectile point types consist of Savannah River Stemmed (and its variants) and Swannanoa Stemmed.

Land use during the Early Woodland period in some areas of the Piedmont suggests extensive use of the inter-riverine zone. Two sites (one in Greenville County and one in Laurens County) contained dense remains and were located on the south face of a slope adjacent to springs. Goodyear et al. (1979:230) suggest that these sites "reflect a fall-winter occupation period with subsistence activities primarily related to nut gathering and deer hunting. If these two sites in fact represent fall-winter base camps it would represent a strong break with previous Archaic systems and their settlement strategies for exploiting inter-riverine biotic resources". Based on these previous studies, Early Woodland sites are most likely to be found adjacent to springs or the upland terraces of tributaries.

Middle Woodland

The Middle Woodland period is found "virtually lacking" in the Laurens-Anderson inter-riverine zone. One densely occupied site in adjacent Laurens County was found in an unusually large floodplain of a rank 2 stream. Goodyear et al. state that:

> [g]iven the habitation like character of this site, plus the large number of simple stamped bearing floodplain sites along larger streams such as the Reedy River, it is tempting to see agriculture playing a role in the apparent re-orientation to floodplain environments during the middle Woodland period in the Piedmont environment. In this regard, the middle Woodland period sites and their locations would seem to presage the late prehistoric Mississippian period pattern during the latter, where large agriculturally related villages were constructed along fertile stretches of floodplain (Goodyear et al. 1979:230-231).

This new pattern is also reflected in the Savannah River Valley where Savannah terrace sites at the mouth of Upper Three Runs Creek were being occupied again for intensive settlement. Midden accumulations at several sites indicate long term occupation or repeated occupations of these sites by relatively large groups (Sassaman et al.

1990:315).

Pottery typical of the Middle Woodland in the Upper Piedmont consists of the Pigeon and Cartersville series. Pigeon is quartz tempered with surface treatments of check stamping, simple stamping, and brushing. The Cartersville type is characterized by sand or grit paste with the primary surface treatment being cordmarking, although there are also check stamped and simple stamped varieties. The Cartersville series is thought to be closely related to the Deptford series on the Coast. Anderson and Schuldenrein (1985:720) suggest that Cartersville continues well into the Late Woodland period. Projectile points typically found in association with these pottery are the Pigeon Side Notched and Corner Notched types.

Testing at 38LU107 (Wood and Gresham 1981) demonstrated that one of the most intensive occupations of this multicomponent site was during the Middle Woodland period. This site is located on a knoll adjacent to South Rabon Creek, near its confluence with North Rabon Creek. A number of features were encountered including a large, deep pit, post holes, and a stone hearth. This indicated that even sites on plowed knolls can and do produce subsurface features.

Since the Middle Woodland period reflects a new pattern of settlement, questions regarding how quickly this change occurred and how the transition to horticulture affected their material culture should be examined. Clearly, this change did not occur over night and perhaps examination of radiocarbon dates from upland and riverine sites during this transition period will begin to clarify questions regarding change in lifeways.

Late Woodland

Small triangular points which are generally believed to be diagnostic of the Late Woodland and Mississippian periods consisted of 12 examples in the Laurens-Anderson study. Ten of these were manufactured from quartz while the other two where manufactured from either rhyolite or a Piedmont silicate. These projectile points were typed as "Mississippian triangulars" and included what they believed were Uwharrie or Pee Dee Triangular types and the Hamilton Incurvate Triangular type. Napier and Connestee Series pottery are typical Late Woodland types for the Upper Piedmont region. The Napier series is a fine sand tempered ware with fine complicated stamped designs. The Connestee series is a thin walled sand tempered ware with brushed or simple stamped surface decorations. There are also cordmarked, check stamped, fabric impressed, and plain varieties (Trinkley 1990).

According to Sassaman et al. (1990:317) Late Woodland occupations in the Savannah River Valley consisted of small habitation sites along all available terrace locations of both tributaries and the Savannah River. This increasing use of low-lying terraces suggests the increased exploitation of floodplain habitats, perhaps including maize agriculture, although no direct evidence has yet been found at the Savannah River Site.

Keel (1976) reported on the Garden Creek Mound No. 3 which contained a dominant Connestee component based on George Heye's 1915 examination of the mound. Later work at Garden Creek Mound No. 2 examined a portion of a village with a large quantity of Connestee remains. A number of post holes were exposed revealing one discernable square house with rounded corners measuring about 19 by 19 feet in outline. In addition, there were a number refuse pits and hearths. The hearths included both rock filled and surface hearths. There were also a number of burial pits (see Keel 1976:99). It is likely that Connestee sites in the Upper Piedmont will contain similar features.

Mississippian Period

The South Appalachian Mississippian period, from about A.D. 1100 to A.D. 1640 is the most elaborate level of culture attained by the native inhabitants and is followed by cultural disintegration brought about largely by European disease.[9] The period is characterized by

[9] Small pox was a major cause of death to a large number of Native Americans during the historic period. The smallpox epidemics of 1734 and 1783

complicated stamped pottery, complex social organization, agriculture, and the construction of temple mounds and ceremonial centers.

In the Upper Piedmont, Mississippian pottery includes the Pisgah and Qualla series. Pisgah ceramics are tempered with unmodified river sand, although some earlier examples contain both river sand and crushed quartz. It is decorated with complicated stamping, check stamping and ladder-like rectilinear patterns (Dickens 1970; Holden 1966). It should be noted that the Qualla series extends well into the historic period (ca.1500-1908) and is characterized by complicated stamping and bold incising. Other types described by Egloff (1967) include burnished, plain, check stamped, cord marked, and corncob impressed. At Tuckasegee brushed examples were also identified (Keel 1976). Other artifacts associated with the Mississippian period include triangular projectile points, flake scrapers, microtools, gravers, perforators, drill, ground stone objects (celts, pipes, and discoidals), and worked shell and mica (Keel 1976).

Very little evidence of Mississippian period occupation was found in the Laurens-Anderson inter-riverine survey area which is not surprising given the focus on riverine resources during this time period. Very little evidence of Mississippian occupation has been documented at the Savannah River Plant and no formal settlement-subsistence model has been created for this area (Sassaman et al. 1990:317). However, Anderson (1994) has provided a detailed examination of evidence for political change at Mississippian sites in the Savannah River Valley and should be consulted for more information.

Excavations at large Mississippian sites in the Upper Piedmont include work at the I.C. Few site which was examined as a part of the Keowee-Toxaway Reservoir project sponsored by Duke Power Company (Grange 1972). Simpson's Field (38AN8) on the Savannah River was also investigated during the Richard B. Russell Reservoir studies (Wood et al. 1986). Work at the Chauga site (38OC47) in nearby Oconee County evidenced occupation in the Early and Late Mississippian period. Ten stages of mound building were found at the site along with burials and palisades. There is evidence for increasing impoverishment of the residents through time, since burials associated with the latest phases of mound building contained fewer grave goods than earlier phases in both the occupation during the Early Mississippian and the Late Mississippian (Anderson 1994:303-305). Homes Hogue Wilson (1986) examined burials from the Warren Wilson site in western North Carolina and provided some preliminary conclusions regarding social structure based on location of burials according to age and sex. For instance, she found more males than females were buried under structure floors. These males included primarily those under 25 or over 35 years old. She also found that individuals buried inside of structures were more likely to have burial goods than those buried in public areas. Burial feature types included pit burials, side-chambered burials, and central-chambered burials. Studies such as this can give great insight into the social organization of prehistoric societies.

The largest amount of regional work has taken place in the North Carolina mountains at sites such as Tuckasegee, Garden Creek, and Warren Wilson. At Tuckasegee a possible town house was uncovered measuring about 23 feet in diameter with a central hearth (Keel 1976). At Warren Wilson several roughly square structures were uncovered and they all measured on the average about 21 feet square. Burials were common inside of these houses and pit features were abundant. Artifacts at the Warren Wilson site included ceramics from the Swannanoa series up through the Pisgah series. (Dickens 1970).

Historic Overview

General accounts of Anderson County history are presented in Clayton (1988), Dickson (1975), and Vandiver (1991). Mills' *Atlas* also shows the location of prominent settlements and localities in the early nineteenth century and gives a brief physical and economic description of the area in the 1820s (Mills 1826).

reportedly killed half of the Cherokee population (Hatley 1993).

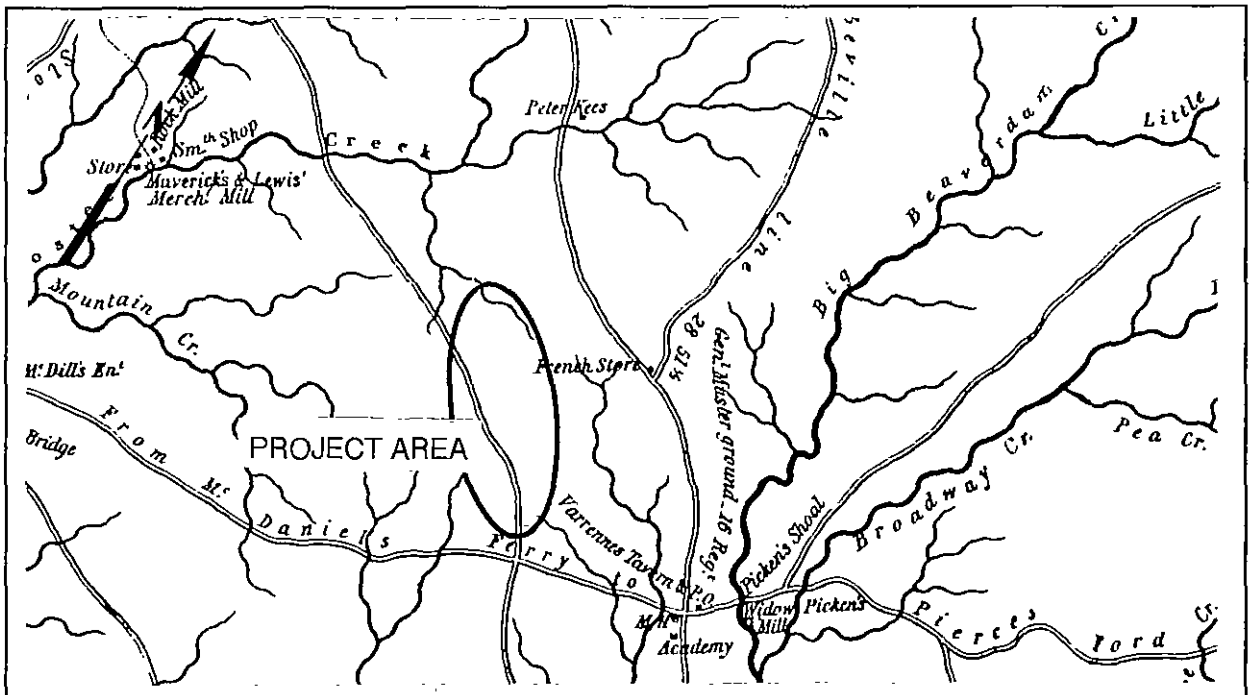

Figure 6. Portion of the 1820 Mills' *Atlas* of Pendleton District showing the project area.

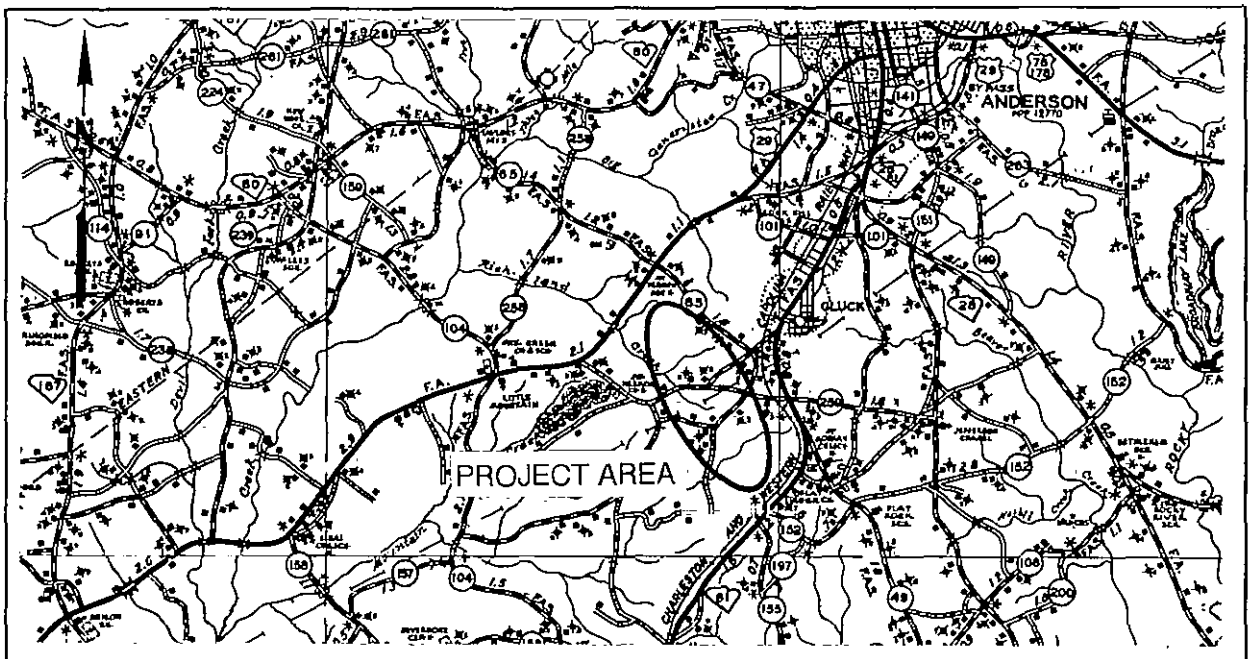

Figure 7. Portion of the 1937 General Highway and Transportation Map of Anderson County showing the project area.

Anderson County is part of the Cherokee Indian lands, acquired by South Carolina in 1777. Mills observed that prior to this treaty:

> few of no emigrations extended as high up the country, as where Pendleton District is now located. By this treaty, accession of lands, and liberty to erect forts on the western frontier, as a barrier against the French on the southwest, were granted by the Indians (Mills 1826:671-672).

Both the treaty and events further north spurred settlement into the area. Most notably, the area was settled by Scotch-Irish from Virginia and Pennsylvania, augmented by Low Country families who came to the up country for summer comfort and remained permanently. Although the area accounts for only about 8% of the state's area, by 1790 it contained about 10% of the state's population.

Anderson County was formed in 1826 along with Pickens County from part of Pendleton District. A central location was selected for the location of the new county's courthouse and the county was named in honor of General Robert Anderson, a Revolutionary soldier who in 1801 had established Andersonville, a river town about 12 miles from modern Anderson, north of the confluence of the Savannah and Seneca rivers. The 1820 Mills' *Atlas* plan of Pendleton District (Figure 6) fails to reveal any subscribers in the project area.

With the introduction of the cotton gin in the late eighteenth century, the area experienced only slow and moderate changes in its society and economy. Initially an area of small, independent and diversified farmers, it slowly became characterized by larger cotton plantations, a reliance on slavery, and a one crop system eventually ruinous to the soil. By 1850 the population included 13,867 whites and 7,514 African-American slaves. The area's 1,986 farms produced only 6,670 bales of cotton, compared with 120,382 bushels of wheat (second only to Laurens County). It also produced 240,277 pounds of butter and cheese, ranking just behind Abbeville County. Co-existing with agriculture, Anderson also supported a thriving industry which ranked fifth in annual production behind Charleston, Edgefield, Laurens, and Richland counties.

Westward emigration of people lured by the expanding cotton kingdom and increasing political polarization defending slavery grew in the first half of the nineteenth century, leading to almost unanimous citizen support in the area for nullification and secession. The county furnished 5,000 Confederate soldiers and became an ammunition-producing center. The county saw only two skirmishes and was spared from the devastation experience by other South Carolina counties. The Anderson area was only slowly "reconstructed," supporting Wade Hampton and his Red Shirts and later supporting the outlaw, Manse Jolly.

By the early twentieth century the county had shifted to textile manufacturing, although widely diversified products were also manufactured, including brooms, horse collars, mattresses, brick, cottonseed products, fertilizer, meal, flour, monuments, and metal shingles. Figure 7 is the 1937 General Highway and Transportation Map of Anderson County revealing that the project corridor is largely open land, with houses primarily clustered along the secondary or farm to market roads.

SURVEY METHODS AND FINDINGS

Methodology

The initially proposed field techniques involved the placement of judgmental shovel tests in areas of high archaeological site probability, such as on ridge crests, ridge saddles, and other level areas near drainages. In addition, occasional shovel tests would also be excavated to evaluated soil erosion. All fill would be screened through 1/4 inch mesh, with each test numbered sequentially. Each test would measure about 1 foot square and would normally be taken to a depth of at least 1 foot. All cultural remains would be collected, except for mortar and brick, which would be quantitatively noted in the field and discarded. Notes would be maintained for profiles at any sites encountered. We anticipated that the corridor would be flagged and that it would be possible to quickly cover the higher probability areas along the 10,500 foot corridor.

Should sites (identified as three or more artifacts within a 25 foot diameter) be identified by either the judgmental shovel testing or pedestrian survey, the location would be recorded and the information required for completion of South Carolina Institute of Archaeology and Anthropology site forms would be collected and photographs would be taken, if warranted in the opinion of the field investigator. No further tests, however, would be conducted since this was only a reconnaissance level investigation and it would not be possible to assess the National Register eligibility of sites identified.

Unfortunately, the corridor had not been surveyed at the time of our study, but we were accompanied by Mr. Richard L. Thomas, Chief Engineer for Douglas Oil and Gas, Inc. and Mr. Roger J. Hartman, Utilities Engineer for BASF in Anderson. The center line of the corridor was roughly flagged during the survey.

As previously discussed, the corridor generally followed an existing electrical transmission line and runs along the edge of several ridges. Where the corridor crosses level ridge tops, screened shovel tests were placed at 100 to 200 foot intervals. In other areas judgmental shovel tests were excavated, but not routinely screened. The purpose of these tests was to evaluate the erosion and soil profiles typical of the corridor.

Since the corridor had not yet been flagged, it was necessary to walk most of the corridor. This provided coverage somewhat greater than typical for a reconnaissance level investigation.

Findings

These investigations revealed that the survey corridor had suffered extensive erosion. No A horizon soils were found in a number of the shovel tests, and often the soil evidenced extensive gravel within the upper 0.5 foot of the profile. Where A horizon soils were present they appeared to be recently formed, probably developing since the land was placed in pasture. The pedestrian survey also revealed that a number of the fields have been terraced, almost certainly to help control previous erosion.

The pedestrian survey did identify one archaeological site, 38AN242, situated on the north side of Tauervus Road, about 1.3 miles west of its junction with SC 81. The central UTM coordinates for this site are E344860 N3812070. The site represents a probable tenant house which has been recently demolished. The site is shown as occupied on the 1964 Anderson South USGS topographic map, which was updated in 1974. The 1937 General Highway and Transportation Map reveals several structures in this immediate area, so it is likely that the site was standing, and occupied during the first third of the twentieth century.

Materials, including whitewares, container glass, brick rubble, and metal items, were found scattered over an area measuring about 100 feet north-south by about 250 feet east-west. The site area had been recently bulldozed, providing near 100% visibility over about 50% of the site area (Figure 8). The remainder of the site exhibited about 50% site visibility, being covered with low, dense grass. Surrounding the site were planted pines. The soils in the area are Cecil sandy loams, although there appears to be little intact A horizon soil in the site area.

Figure 8. View of 38AN242 looking to the north-northeast from the road.

The proposed pipeline corridor was shifted to the east in order to avoid this site and stay on property for which BASF and Douglas had already obtained right-of-way. Consequently, this site will not be affected by the proposed undertaking.

No other historic or prehistoric remains were encountered in the investigations.

CONCLUSIONS AND RECOMMENDATIONS

The background research for this project failed to identify any known or suspected archaeological sites, although the piedmont topography is certainly appropriate for the recovery of Archaic Period prehistoric and nineteenth or twentieth century historic archaeological sites. Tempering this assessment, however, is the documented extent of erosion in Anderson County, especially associated with the steep soils and cultivated ridgetops associated with the area.

The archaeological survey combined pedestrian survey with judgmental shovel testing. Since the survey tract had not been previously flagged, nearly the entire corridor was walked, allowing greater than normal coverage. Virtually all of the shovel tests revealed a very thin A horizon or an absence of A horizon soils. In addition, a number of side slopes showed evidence of previous terracing, probably as a result of the natural erosion tendencies.

One archaeological site was identified on what was originally planned to be the project center-line. Since the actually survey corridor had not been staked, it was possible to shift the corridor to the east in order to miss this site. No other archaeological sites were encountered on the corridor, although not all areas were subjected to intensive shovel testing.

This reconnaissance level investigation found little evidence of archaeological remains in the immediate area, although it did document extensive erosion. Consequently, it is our recommendation that no additional survey is necessary for this tract, pending the review and concurrence of the S.C. State Historic Preservation Office.

There remains, of course, the possibility that unrecorded archaeological sites may be identified during the construction of the project. While unlikely, sites might be identified by concentrations of bricks, bottles, pottery, ceramics, arrowheads or other stone tools, flakes, or even bones. Should such remains be found, it is our recommendation that construction be halted and that either Chicora or the State Historic Preservation Office be notified of the finds. This will allow a more complete evaluation.

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